

**REMARKS**

Applicants have carefully considered the May 4, 2005 Office Action, and the amendments above together with the comments that follow are presented in a bona fide effort to address all issues raised in that Action and thereby place this case in condition for allowance. Claims 10-21 were pending in this application. In response to the Office Action dated May 4, 2005, claims 10, 11 and 15-18 have been amended. Care has been exercised to avoid the introduction of new matter. Adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, the depicted embodiments and related discussion thereof in the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue. Entry of the present Amendment is respectfully solicited. It is believed that this response places this case in condition for allowance. Hence, prompt favorable reconsideration of this case is solicited.

The title of the invention has been amended in accordance with the Examiner's helpful suggestion. As such, the Examiner is requested to reconsider and withdraw the objection.

Claim 18 was objected to because of minor informalities. Applicants have amended the claim to recite the exponents in superscript font. Accordingly, reconsideration and withdrawal of the objection are respectfully solicited.

Claims 11-14 and 18-20 were rejected under 35 U.S.C. § 112, second paragraph. Applicants traverse. Applicants have amended independent claim 11 to provide antecedent support for the claim term identified by the Examiner. Accordingly, one having ordinary skill in the art would not have difficulty understanding the scope of the presently claimed invention, particularly when reasonably interpreted in light of the supporting specification. Therefore, it is

respectfully submitted that the imposed rejection of claims 11-14 and 18-20 under 35 U.S.C. § 112, second paragraph is not legally viable and hence, solicit withdrawal thereof.

Claims 10, 11 15, 18, 19 and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated over Gardner et al. (U.S. Pat. No. 5,937,301, hereinafter “Gardner”). Applicants traverse.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the identical disclosure in a single reference of each element of a claimed invention, such that the identically claimed invention is placed into the possession of one having ordinary skill in the art. *Helifix Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994). Moreover, in imposing the rejection under 35 U.S.C. § 102, the Examiner is required to specifically identify wherein an applied reference is perceived to identically disclose each feature of a claimed invention. *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984). That burden has not been discharged. Moreover, there are significant differences between the claimed inventions and the method disclosed by Gardner that would preclude the factual determination that Gardner identically describes the claimed inventions within the meaning of 35 U.S.C. § 102.

With respect to independent claim 10, Gardner fails to disclose or suggest a silicon nitride film, much less a silicon nitride film formed on a second dielectric layer, as required in independent claim 10. Gardner does not disclose or suggest a silicon nitride layer formed on the silicon dioxide layer 207. Accordingly, Gardner fails to teach or suggest every limitation of independent claim 10 as amended.

Independent claim 11 recites, in pertinent part, a step of causing the first nitrogen concentration profile to be altered to form a second nitrogen concentration profile within the first gate, the second nitrogen concentration profile comprising the first nitrogen-rich region, the second nitrogen-rich region and a contiguous reduced-nitrogen region located between the first nitrogen-rich region and the second nitrogen-rich region, the contiguous reduced-nitrogen region having a lower concentration of nitrogen than the first nitrogen-rich region and the second nitrogen-rich region.

Independent claim 21 recites, in pertinent part, a step of heating the polysilicon layer to cause the implanted nitrogen to form a first nitrogen-rich region substantially adjacent to the underlying dielectric layer and a substantially separate second nitrogen-rich region substantially adjacent the overlying dielectric layer, thereby leaving a reduced-nitrogen region located within the polysilicon layer between the first nitrogen-rich region and the second nitrogen-rich region, wherein the reduced-nitrogen region always has a lower concentration of nitrogen than the first nitrogen-rich region and the second nitrogen-rich region.

Independent claim 11 and 21 each requires a reduced-nitrogen region within the gate (or polysilicon layer) between the first and second nitrogen-rich regions and has a lower concentration of nitrogen than the first and second nitrogen-rich regions. Applicants submit that Gordon fails to disclose or suggest every limitation of independent claims 11 and 21. Applicants further submit that the Examiner did not discharge the initial burden of establishing a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. § 102 for lack of novelty, and that the Examiner's reliance upon the doctrine of inherency is misplaced.

Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.

*In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 212 USPQ 323, (CCPA 1981). To establish inherency, the extrinsic evidence must make clear that the missing element must necessarily be present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *Finnegan Corp. v. ITC*, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999); *Continental Can Co. USA v. Monsanto Co.*, 20 USPQ 2d 1746 (Fed. Cir. 1991); *Ex parte Levy*, 17 USPQ2d 1461 (BPAI 1990).

Gordon is directed to a method of making a semiconductor device having side wall spacers with improved profiles. The presence of nitrogen on the spacers serves to decrease the susceptibility of the device to hot carrier injection effects. See Gordon at col. 4, lines 34-36. Gordon discloses that the spacers 219 generally have a higher concentration of nitrogen at the top than near the base. See Gordon at col. 4, lines 16-18. Thus, although Gardner disclose the introduction of nitrogen in the gate and spacers, Gardner does not teach or remotely suggest a reduced-nitrogen region within a gate (or polysilicon layer) between first and second nitrogen-rich regions and with a lower concentration of nitrogen than the first and second nitrogen-rich regions. Thus, there is a factual basis of record to support the determination that the methodology disclosed by Gardner is not capable of producing a reduced-nitrogen region in the gate as presently claimed, thereby undermining the Examiner's notion of inherency. Based upon the foregoing, Applicants respectfully submit that the Examiner did not discharge initial burden of establishing a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. § 102 for lack of novelty. Moreover, the Examiner has not established the requisite basis upon which to invoke

the doctrine of inherency which requires certainty. In addition, there is a sufficient basis in the reference to Gardner itself to undermine the inherency theory.

Dependent claims 12-14 were rejected under 35 U.S.C. § 103(a) over Gardner. Applicants traverse. Applicants incorporate herein the arguments previously advanced in traversal of the rejection of independent claim 11 under 35 U.S.C. § 102(b) predicated upon Gardner. Dependent claims 12-14 are free from the applied art in view of their dependency from independent claim 11.

Dependent claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner in view of Tanigami et al. (U.S. Pat. No. 6,069,041, hereinafter "Tanigami"). Applicants traverse.

Applicants incorporate herein the arguments previously advanced in traversal of the rejection of claim 10 under 35 U.S.C. § 102(b) predicated upon Gardner. Gardner fails to disclose or suggest a silicon nitride film and a second silicon dioxide film formed on the silicon nitride film. Nevertheless, the Examiner asserted that since Gardner and Tanigami are from the same filed of endeavor, it would have been obvious to a person of ordinary skill to modify the method of Gardner as suggested by Tanigami because Tanigami discloses that an ONO film is a preferable interlayer capacitive film having a dielectric constant of more than a predetermined value.

Moreover, Appellants submit that Gardner and Tanigami that one of ordinary skill in the art would not have been realistically motivated to combine the references, as proposed by the Examiner. One skilled in the art confronted with the problem of Gardner (hot carrier injection effects in sidewall spacers) would not look to Tanigami to solve their problem, because Tanigami is not reasonably pertinent to the particular sidewall spacer problem addressed by Gardner.

Further, Applicants stress that the requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103 requires not only a suggestion but a reasonable expectation of success as to a particular benefit. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Obvious to try is not the standard. *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988). As the Examiner has not established that the prior art teaches, with a reasonable expectation of success, that a particular benefit would result from the Examiner's proposed combination, Applicants respectfully submit that one having ordinary skill in the art would not have been motivated to modify the combination of Gardner and Tanigami.

Moreover, as disclosed at page 9, lines 8-13 of the written description of the specification, nitrogen is preferably implanted into the gate following the formation of the first dielectric layer and the overlying silicon nitride film, because this reduces the potential for causing damage to the first dielectric layer. Thus, a problem addressed and solved by the claimed invention constitute a potent indicium of nonobviousness which must be given consideration regarding the ultimate legal conclusion of nonobviousness under 35 U.S.C. § 103.). It is well settled that the recognition of a source of a problem constitutes evidence of nonobviousness. *In re Spinnoble*, 405 F.2d 578, 160 USPQ 237 (CCPA 1969).

Based upon the arguments submitted *supra*, it should be apparent that a *prima facie* basis to deny patentability to the claimed invention has not been established for want of the requisite factual basis and lack of the requisite realistic motivation. Moreover, there are potent indicia of nonobviousness of record which undermine the Examiner's obviousness conclusion.

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Claims 10-21 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Pat. No. 6,001,713 in view of Gardner. Applicants submit herewith a Terminal Disclaimer with respect to the '713 Patent, thereby overcoming the imposed rejection on the ground of obviousness-type double patenting. Applicants, therefore, respectfully solicit withdrawal of the imposed rejection of claims 10-21.

It is believed that all pending claims are now in condition for allowance. Applicants therefore respectfully request an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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